EXAMPLES

[0131] Now, the present invention will be described in detail with reference to Examples. However, it should be understood that the present invention is by no means restricted to such specific Examples.

Example 1

[0132] In Example 1, 5 fine channel devices each having the construction as shown in **FIG. 6**(*b*) were prepared. A fine channel **19** formed in each fine channel device was branched into two fine channel portions in a Y-letter like form at each side of fluid inlet and outlet ports. The inner structure of the fine channel of the fine channel device was such that, as shown in **FIG. 6**(*a*), partition walls **22** having the substantially same height as the depth of the fine channel were formed intermittently along a flowing direction of fluid **17** at a substantially central portion with respect to a width direction of the fine channel. The width **9** of each fine channel was 100 μm, the depth **17** was 20 μm and the length was 30 mm. 5 Kinds of fine channel in which the minimum distance **25** between adjacent partition walls in a flowing direction of fluid and the maximum length **26** of each partition wall in a flowing direction were respectively 50 μm, 100 μm, 200 μm, 400 μm and 800 μm were formed in the 5 fine channel devices. The thickness **23** of each partition wall in a width direction was about 5 μm.

[0133] As shown in **FIG. 6**(*b*), each fine channel was formed in each Pyrex (trademark) glass substrate **32** having a size of 70 mm×38 mm×1 mm (thick) according to conventional photolithographic and wet etching techniques, and each cover member **34** comprising a Pyrex (trademark) glass substrate having the same size as the fine channel substrate in which penetration holes **35** having a diameter of 0.6 mm were formed mechanically at positions corresponding to inlet ports A **28**, B **29** and outlet ports C **30**, D **31**, was prepared. Each cover member was thermally bonded on each fine channel substrate to seal hermitically the fine channel.

[0134] Water and cyclohexane were supplied respectively into each of the fine channel devices at the same flow rate in a range of from 3 μL/min to 50 μL/min. Here, the viscosity of water at 20° C. was 1.002 [mPa~s] and the viscosity of cyclohexane was 0.979 [mPa·s] at the same temperature, which were substantially the same as the water. Water was supplied from an inlet port A **28** and cyclohexane was supplied from an inlet port B **29** under the above-mentioned flow rate condition, and an amount of cyclohexane in which an amount of water was contaminated discharged from an outlet port C **30** and an amount of water in which an amount of cyclohexane was contaminated discharged from an outlet port D **31** were measured respectively by a graduated cylinder respectively. Table 1 shows a result.

TABLE 1

Flow rate (μL/min) Distance between adjacent partition walls (μm)	3	5	8	10	20	50
Contamination percentage of organic phase to aqueous phase (%)						
50	3.3	3.4	1.2	3.0	4.3	0.0
100	5.3	0.0	0.0	0.0	0.0	0.0
200	0.0	0.0	0.0	0.0	0.0	4.8
400	41.7	27.6	0.0	0.0	0.0	0.0
800	35.8	28.7	12.4	9.5	18.1	41.7
Comparative Example	—	55.0	47.5	38.6	49.1	—
Contamination percentage of aqueous phase to organic phase (%)						
50	0.0	0.0	0.0	0.4	0.0	5.1
100	2.2	3.5	1.4	0.0	0.0	0.0
200	3.4	6.9	9.6	2.0	2.4	1.1
400	33.6	14.3	3.1	3.7	0.0	9.1
800	32.3	29.9	7.3	12.0	55.4	39.1
Comparative Example	—	38.9	34.3	42.0	67.8	—

[0135] Table 1 shows contamination percentages of fluid: a contamination percentage (%) of an organic phase to an aqueous phase and a contamination percentage (%) of an aqueous phase to an organic phase, at flow rates of 3, 5, 8, 10, 20 and 50 μL/min when both the aqueous phase and the organic phase are supplied under the same flow rate condition. Minimum distances between adjacent partition walls in a flowing direction of fluid are determined to be 50, 100, 200, 400 and 800 μm respectively.

[0136] As understood from the result in Example 1, when the minimum distance between adjacent partition walls in a flowing direction of fluid was 400 μm or less, a contamination percentage of less than 10% could be achieved at a flow rate in a range of from 8 to 50 μL/min. When the minimum distance between adjacent partition walls in a flowing direction of fluid was 800 μm, a contamination percentage of less than 10% could not be achieved even at any flow rate.

Example 2

[0137] In Example 2, fine channel devices, as shown in **FIG. 6**, used in Example 1 were used. Cyclohexane was supplied at a fixed flow rate of 8 μL/min, and water was supplied by changing the flow rate in a range of from 3 μL/min to 20 μL/min. Namely, water was supplied from the inlet port A **28** and cyclohexane was supplied from the inlet port B **29** under the above-mentioned flow rate condition so that a ratio of the flow rate of water to that of cyclohexane is in a range of from 0.375 to 2.5, and an amount of cyclohexane in which an amount of water was contaminated discharged from the outlet port C **30** and an amount of water in which an amount of cyclohexane was contaminated discharged from the outlet port D **31** were measured by a graduated cylinder respectively. Table 2 shows a result.

TABLE 2

Flow rate ratio Distance between adjacent partition walls (μm)	0.375	0.625	1.000	1.250	2.500
Contamination percentage of organic phase to aqueous phase (%)					
50	11.0	9.5	1.7	0.0	23.8
100	15.0	3.5	0.0	0.0	4.2